MECHATRONICS BOOK SERIES

CONTROL AND INTELLIGENT SYSTEMS

Momoh Jimoh E. Salami
Abiodun Musa Aibinu
Yasir Mohd Mustafah

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EDITOR

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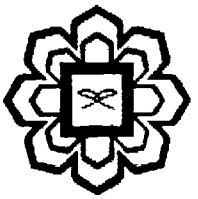

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Table of Content

Chapter 2
Design and Development of controller of Active Power Filter for Industrial Usage part 1

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2.1 Introduction

Power electronics belongs to power, electronics and control. Power covers the area of production, conversion, transfer, distribution and utilization of electric energy at high efficiency, that is, at low loss. Power electronics processes and controls the power by supplying voltage and currents in a suitable form for user loads. The power input to the power processor, usually, supplied from the electric utility at a line frequency of 50 to 60 Hz, in single-phase or three-phase.

2.2 Harmonics

A periodic waveform can be described as a sum of sine waves with the frequency being multiples of the fundamental frequency. The non-fundamental components are called "harmonic distortion. Harmonic voltage distortion can be classified as voltage harmonic distortion and current harmonic distortion. Figure 1a shows the fundamental frequency wave (F1) with the 3rd harmonic frequency wave (3F1) and the 5th harmonic frequency wave (5F1), the resultant of the above three waveform, which is the major deviation from the fundamental wave (F1) is shown in Figure 2.1b.

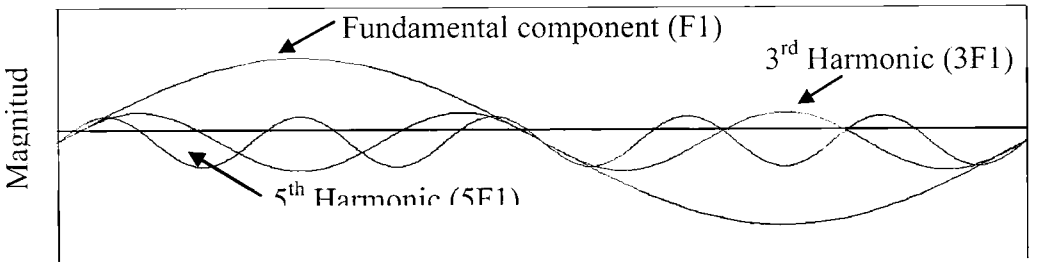

Figure 2.1a

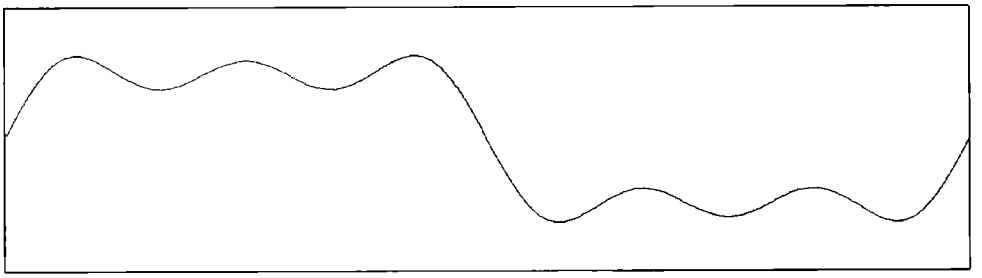

Figure 2.1b